The Thesis Committee for Chian-Ann Lu
Certifies that this is the approved version of the following thesis:

Crafting Darkness

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor:

Michelle Habeck

Susan Mickey

Crafting Darkness

by

Chian-Ann Lu, B.A.

Thesis

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Fine Arts

The University of Texas at Austin

May 2017

Abstract

Crafting Darkness

Chian-Ann Lu, M.F.A.

The University of Texas at Austin, 2017

Supervisor: Michelle Habeck

The environment has the power to affect human's behavior. We, as human beings, perceive our environment very sensitively every single second. The environment is as important as the air we breathe. Elements of the environment that can affect people include spacial arrangement, light, sound, temperature, and smell, A good environmental design is attentive to human perception and can help to improve human working abilities.

However, in the modern society, most environmental designs are not friendly to people due either to limited budgets or due to lack of consideration for the design of such a space. A poorly designed environment may subliminally be perceived negatively and create a condition which may for some cause a decrease in working ability and a loss of efficiency.

In my thesis, I will redesign the Winship B.204 to create an environment that can increase and improve people's working ability. The design of the environment will

incorporate the complimentary elements of lighting, sound, smell, spacial arrangement, and temperature so as to define the style and character of the space. In addition, I will explore different ways to apply natural elements to the design of this environment. I will use the Theatre and Dance graduate design studio located in Winship B.204 at The University of Texas at Austin as a prototype in order to discover ways in which the space with applied design adjustments might improve the occupant's process of imagination and inspire creativity.

Table of Contents

List of Illustrations

Chapter 1: Motivation

The concept of this thesis derives from my interest in the interaction between Inhabitable environments and the human psychological response to environmental space and human's psychological status. In the early period of my research, I found two films relatively inspiring for my study. The film titled *Inception* released on July 13, 2010 and the film titled *The Matrix* released on March 31, 1999. Both films approach the notion that the reality we perceive in daily life may not in fact be real. Questions considered in the works included. Is our reality a true reality? What should we believe? What could be discovered when we begin to doubt our perceived reality? These questions posed by the films lead me to rethink our relationship within our perceived environments.

In addition to the subject matter surrounding ideas of perceived reality, I hold a great interest in the ways in which a friendly environment might help to assist human beings toward improving their working abilities. One of my family members has long suffered from work related stress and depression. I believe it necessary for modern society to respond to and make accommodations to the pace of this contemporary industrial society so as to support and help others to achieve a high working efficiency and productive outcome. However, compromises and a lack of attention toward the improvement of modern working environments coupled with the current expectations of high productivity regularly deprive the working society of new ways to approach diverse thinking and of practicing creativity.

This notion drives me to further consider contributions and improvements I might make to change the current status quo for my population of working specialists, the theatrical designer.

I believe that the environment can affect human beings' behavior. As a theatrical designer, I could create fantastic and magical illusions so as to reshape and re-craft our perception to the environment. My primary focus is to redesign a working space, which might currently be understood as a poor working space or possessing conditions that do not promote creative thinking or relieve stress. Considerations for this conceptual challenge lead me to consider my own working space that I inhabit both day and night, the Theatre and Dance graduate design studio located in Winship B.204 at The University of Texas at Austin. It is a pace located in the basement of the Winship Drama building. I feel the space will prove a strong research target for the observation of and for problem-solving a redesign process. I will utilize two 3D computer graphic software programs. Sketchup will be employed for the digital modeling process and V-Ray for the rendering of interior and exterior details within the digital modeling environment. I will use this redesign process as an opportunity to learn new modeling and rendering skills.

As a designer, I firmly believe that everyone deserves a good working environment. Inspired by an often-practiced mantra at The University of Texas at Austin is "What starts here changes the world." I seek through the journey of this thesis process to apply my knowledge of lighting and design to make a difference and improve the working conditions for those in my theatrical design society.

Chapter2: Guiding questions

- How can the environment status affect human behavior?
- How can the environment status affect human psychology?
- How does the brain React and respond to a varying to different environment?
- What are the possibilities for Winship B.204?
- What improvements might we apply to our working space?
- What 3D graphic software can provide in the design process?
- How might a theatrical designer contribute to the redesign of an effective and inspiring creative workspace?

Chapter 3: Case study Google office located in North America

Google, an American multinational technology corporation specializing in Internet-related services and products, is known for its creative interior design of the working space. As a technology foundation company, their office should be designed to include the features of a so-called controlled space. As indicated by Marcus Friars, The editor-in-chief of the Dezeen digital journal, "A 'control' culture works the best where there is a high ratio of individual to group space, more formal spaces with higher enclosure, structured, symmetrical layouts and a less-flexible environment[1]." However, The Google office has applied a design to it's space that moves in a direction nearly opposite to that of a controlled space. Their office is considered to be one of the most inspiring and the most relaxing offices in the world. Google chose to define their office space as an open, colorful, fun-filled, and "collaborate space" and design their office space as a working playground showing off their idea of an open business culture so as to inspire employees.

The choice of making the office playful imparts many benefits for both the employers and the employees. First, the stylistic design can bolster the company's culture and reputation by boosting the morale among collaborators. Second, the creative environment not only enhances their employees' creativity but also helps to lower work related stress.

[1] https://www.dezeen.com/2016/03/22/haworth-white-paper-research-how-to-create-a-successful-organisational-culture-working-styles-office-design/

The multiple components that the Google corporation uses for the building of the playground environment include the use of color, plants, natural lights, and some interesting facilities such as swing chair and slide. They purposely move the natural elements from out of doors to the indoor space. I will apply this idea to my design and strive to create a working culture in to the newly designed Winship B.204 studio space. I will apply my theatrical design experience to manipulates the space in to a friendlier environment by controlling the light, color, and intensity. Taking all in to account, the Google corporate office functions as an ideal model providing important inspiration to me in the my design process.

Chapter 4: Methodology

4-1 Design concept

Crafting Darkness is a redesign of the Theatre and Dance graduate design studio located in Winship B.204 at The University of Texas at Austin that Incorporates design choices sensitive to and responsive to lighting, sound, projection, smell, and temperature. I seek to apply elements from nature to the space this design community works in both day and night. I seek to create a visceral experience to make this environment more attentive to design community in hopes to enhance their creativity. I will approach this project through a careful observation and research process to collect ideas and to approach and provide solutions to the design problem. I will make reference to my own expertise in lighting to design a better working space. The theatre and dance design and technology graduate studio at UT Austin studio is a space located at basement level lacking windows and walls of cold concrete. Numerous industrial pipes hang from the ceiling adding a physical pressure to the space above the working artists. There are no natural elements in this space. It is a cold box lacking natural light.

My first step is to re-arrange the space so as to decrease the feeling of the overhead pressure. I will then divide into four areas: a meeting area, a public working area, a private working area, and a relaxing area. People who work in this studio are then able to choose a preferable space to fit their working mood. I will make use of glass materials to assist in the efforts to lower the perception of interior pressure. The choice of glass

material offers additional lighting related possibilities included the possibility of filtering light from an outside area in to the space. This new arrangement of the studio will help to create a friendlier working environment. The second step is to introduce the application of natural elements, sounds and colors to the space so as to create varied visuals impacts and visceral experiences. The primary goal of these additional design choices is to manipulate the human perceptive experience for the visual, auditory and psychological states.

4-2: Design research process

The following images, models and material illustrate a portion of the research that has inspired the finished redesign of the Winship B.204 Theatre and dance design and technology studio.

Illustration 1: Natural elements placed in the indoor environment[1].

Natural elements like grass can soften the architectural geometry and also bring in color.

---

1 Decoist (Ed.). (2015, March 12). Pinterest. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790169944765/

Illustration 2: Colorful elements[1].

Colorful wall paintings create visual interest and break the linear shapes of the beams.

1 (n.d.) Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790172963600/

Illustration 3: Visual illusion[1].

A non-straight line pattern disorients the perception of the hallway and transforms the space into an art piece.

1 (n.d.). Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790174915188/

Illustration 4: An open window with natural sunlight[1].

An open sky window provides a connection to the outdoor environment.

1 (n.d.). Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790172963673/

All the images I found are from Pinterest[1]. The first area of observation and research was to view various ways in which natural elements could be incorporated into interiors. The second area of observation and research was to research how the use of color in an interior space changed its perceived size, purpose and psychological effect on the inhabitants of the space. The last area of observation and research was to investigate how interesting installations might increase the energy of the space. The ultimate goal is to create a space in which people feel comfortable and encourages a positive and creative working environment.

[1] A photo sharing website. Created by Ben Silbermann, Paul Sciarra and Evan Sharp.

4-3: Winship B.204

Illustration 5: Winship B.204 graduate student studio South East corner.

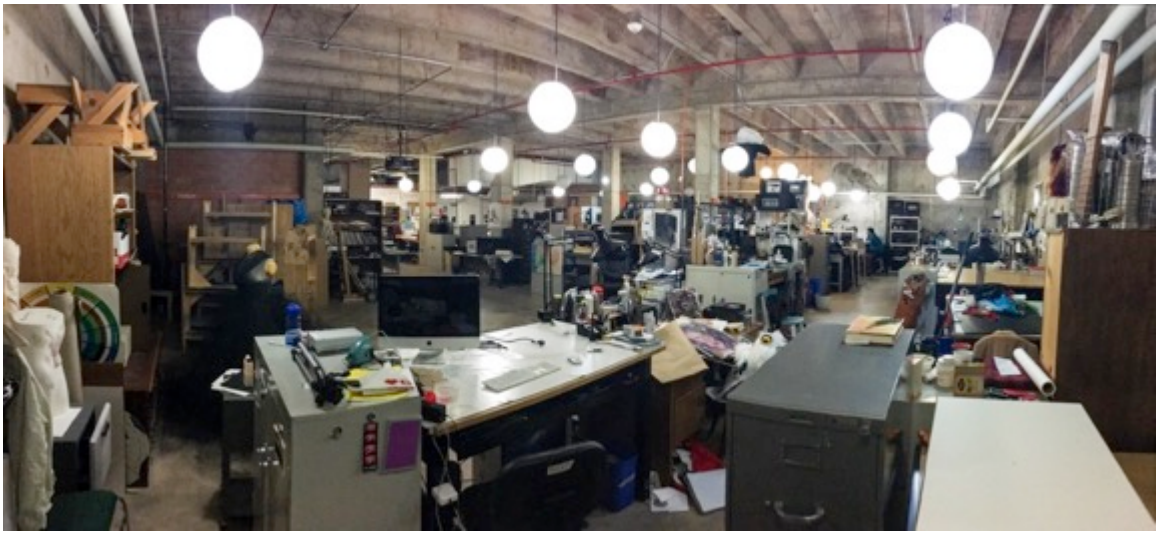


Illustration 6: Winship B.204 graduate student studio South West corner.

Illustration 7: Winship B.204 graduate student studio Middle West corner.

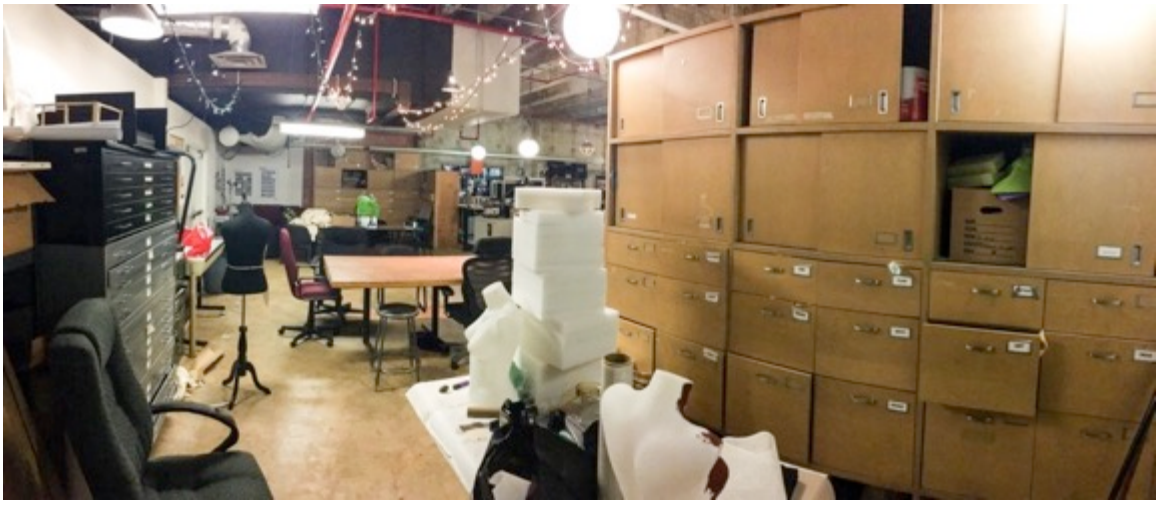


Illustration 8: Winship B.204 graduate student studio North West corner[1].

[1] All photos credits to Chian-ann Lu, 2016.

This space, Winship B.204, is an adequate space for the graduate students to create art works; however, we can tell from the illustrations that the studio is built into a space with concrete surface and white florescent lights. When people walk into the studio, their first impression is that it is a cold and lethargic environment. There are no windows and therefore no way in which to indicate the time of day. As a result, the design populations working in this environment lose their connection to the natural world outside. The space is in need of new arrangement and organization in order to create a smoother moving space and to increase the working efficiency. The current layout and design of the space does not promote creativity and efficiency as well as it could.

4-4: Software introduction

4-4-1: SketchUp

Illustration 9: SketchUp logo mark[1].

I am new to working with 3D graphic software. SketchUp, I have found is a useful tool as it is easy to use and affordable for a student budget. It is equipped with a 3dwarehouse which provides a variety of ready made fair use model elements. SketchUp is also efficient when it comes to computer memory requirements. It proves to be a smart and cost effective tool to use.

As defined by Wikipedia[2]: SketchUp (formerly Google Sketchup) is a 3D modeling computer program for a wide range of drawing applications such as architectural, interior design, landscape architecture, civil and mechanical engineering, film and video game design. It is available as a freeware version (SketchUp Make) and a paid version with additional functionality (SketchUp Pro).

SketchUp is owned by Trimble Navigation, a mapping, surveying and navigation equipment company. There is an online library of free model assemblies (e.g. windows,

---

1 SketchUp. (n.d.). Pinterests. Retrieved May 2, 2017, from https://www.pinterest.com/pin/521925044285764430/

2 SketchUp. (n.d.). In Wikipedia. Retrieved May 2, 2017, from https://en.wikipedia.org/wiki/SketchUp

doors, automobiles), 3D Warehouse, to which users may contribute models. The program includes drawing layout functionality, allows surface rendering in variable "styles", supports third-party "plug-in" programs hosted on a site called Extension Warehouse to provide other capabilities (e.g. near photo-realistic rendering) and enables placement of its models within Google Earth.

4-4-2: V-Ray

Illustration 10: V-Ray logo mark[1].

V-Ray is a plug-in software for SetchUp that assists the user when creating photorealistic rendering. It is a popular plug-in used most frequently in the area of architecture and interior design. The SketchUp model is the foundation and structured space to which rendered surfaces and detailed texture materials are placed within using the V-Ray plug-in. V-Ray calculates light reflection and bounce from surface textures as a part of the process in the creation of photorealistic images of a digitally designed interior or exterior space. As a lighting designer, I found the V-Ray useful for me. Compared to the other software in the market, V-Ray comes with more accuracy in calculation. It proves a better pre-visualization tool for designers which in turn improves client project communications.

As defined by Wikipedia[2]: V-Ray is a commercial rendering plug-in for 3D computer graphics software applications. It is developed by Chaos Group a Bulgarian

1 Pacisoft. V-Ray. Retrieved May 2, 2017, from http://www.pacisoft.vn/en/uncategorized-vi/splash-page-mai-v-ray-sketchup-prison-50-va-nang-cap-mien-africa/

2 V-Ray. (n.d.).In Wikipedia. Retrieved May 2, 2017, from https://en.wikipedia.org/wiki/V-Ray

company based in Sofia, Bulgaria, established in 1997. V-Ray is used in media, entertainment, and design industries such as film and video game production, industrial design, product design and architecture.

Chapter 5: Design process: The crafting of digital illustarates

5-1 New layout of Winship B.204

Illustration 11: New layout of Winship B.204

I have arranged the space focusing primarily on movement and efficient pathways from spade to space. The space is divided into a public area, a private area, a relaxation area and a playground area. Because the limitation of the space, It is challenging to fit all necessary studio materials into the currently allotted square footage. In order not to increase the visual lightness. I focused my use on glass rather than on wood for wall structures. This design choice will help to solve the construct of visual barriers and provide the environment with more translucent and lighted characteristics. I will next describe the room area by area. The space is divided into a public area, a private area, a relaxation area and a playground area. I begin with the public area.

Illustration 12: Public area, Food corner.

Illustration 13: Public area, Coffee zone.

Illustration 14: Playground area and relaxation zone.

Illustration 15: Private working area.

Illustration 16: Private meeting area.

Illustration 17: Public display wallspace.

Illustration 18: Public welcome area.

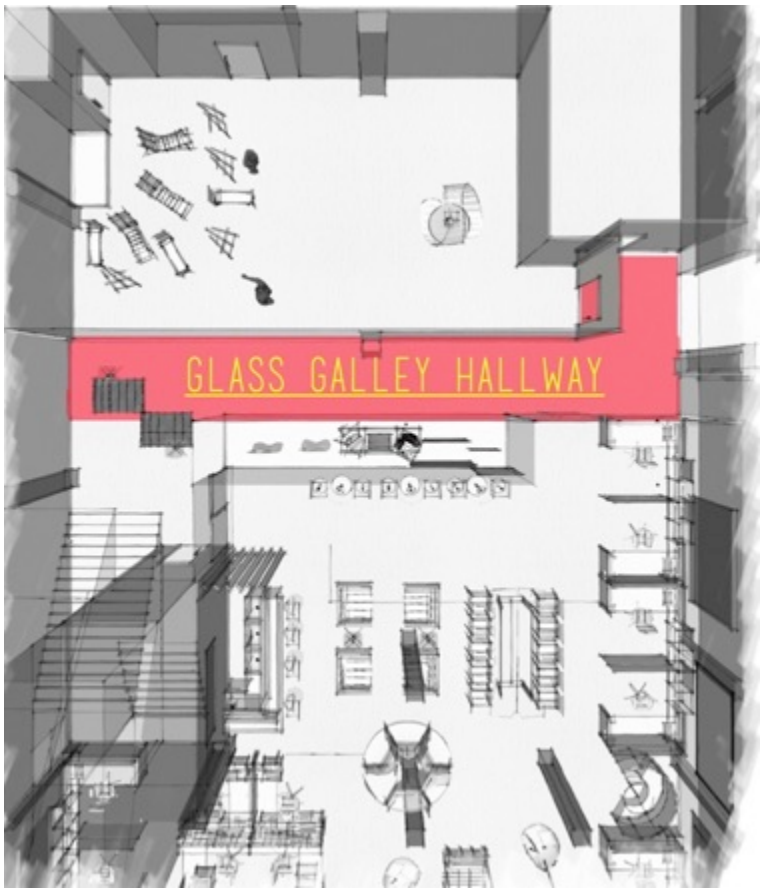


Illustration 19: Public display glass gallery and outer studio hall space.

Illustration 20: Studio bathroom space.

Illustration21: Studio classroom, drawing lab and drafting space[1].

[1] All rendering credits to Chian-ann Lu, 2017

5-2: The application of SketchUp illustrations

Illustration22: SketchUp rendering/Food corner and public zone.

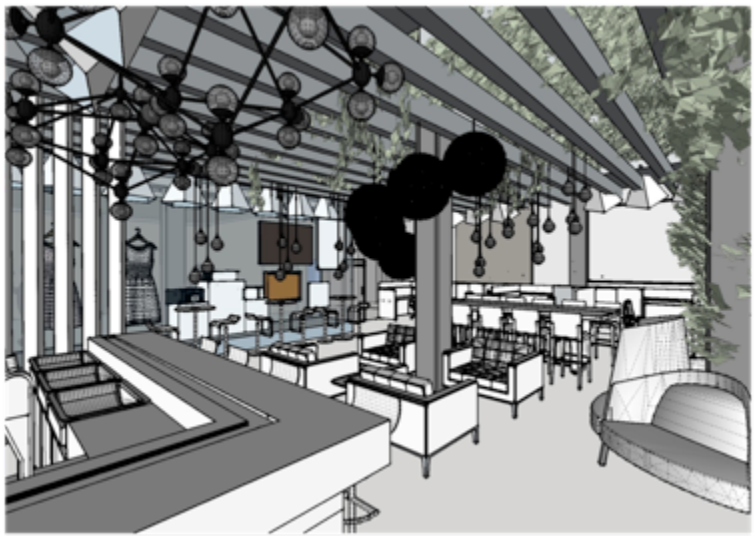


Illustration23: SketchUp rendering/Food corner and public zone.

Illustration24: SketchUp rendering/Food corner and public zone.

Illustration25: SketchUp rendering/East entrance .

Illustration26: SketchUp rendering/West entrance.

Illustration27: SketchUp rendering/Private working area.

Illustration28: SketchUp rendering/Play ground and relax zone.

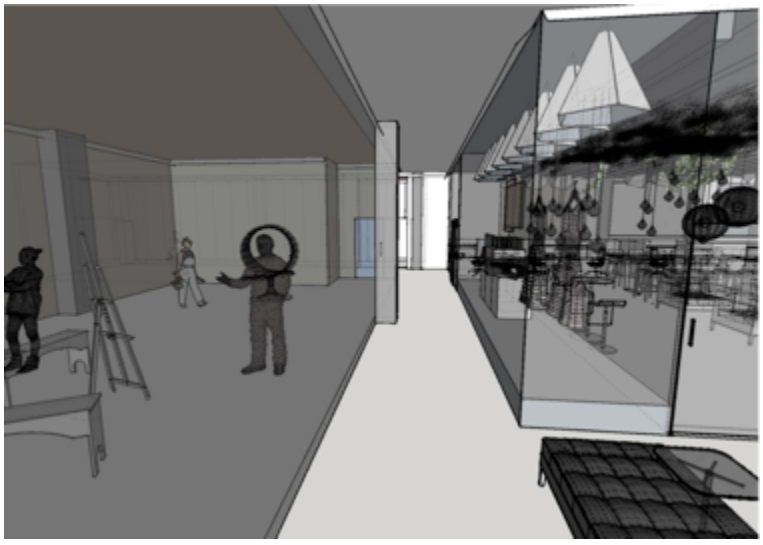


Illustration29: SketchUp rendering/Welcome area and hallway gallery.

Illustration30: SketchUp rendering/Hallway gallery and drafting room[1].

[1] All rendering credits to Chian-ann Lu, 2017

5-3: The application of V-Ray illustrations

Illustration31: V-Ray rendering/Food corner and Public area with calligraphy pillar.

Illustration32: V-Ray rendering/Food corner and Public area with cloud pillar.

Illustration33: V-Ray rendering/Food corner and Public area with cloud pillar.

Illustration34: V-Ray rendering/Private area and play groundwith cloud pillar.

Illustration35: V-Ray rendering/ Private area with forest pillar.

Illustration36: V-Ray rendering/ Private area with sunset pillar.

Illustration37: V-Ray rendering/ Hallway gallery with cloud pillar.

Illustration38: V-Ray rendering/ Private area with sunset pillar[1].

[1] All rendering credits to Chian-ann Lu, 2017

Chapter 6: Design process:

The thesis exhibition and its visceral effects

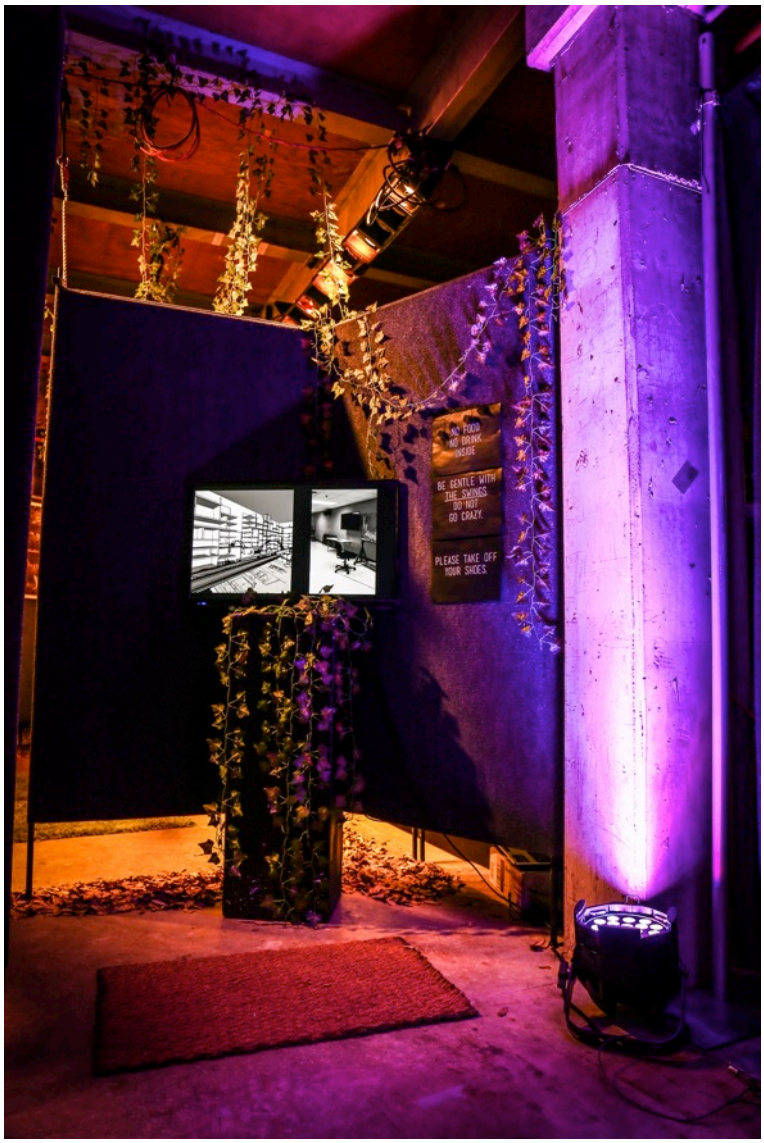


Illustration 38: Exhibition image/Entrance[1]

[1] Photo credits to Chian-ann Lu, 2017

The thesis exhibition takes place in the basement of the Winship Drama Building in the University of Texas at Austin. It is an indoor dusty space with no windows and little connection to the outer world. Transforming this space into a friendly environment to enhance the designers' working abilities and how to integrate my design concept with it is my primary goal.

In the early stage of the process, I cleaned the space in an effort to provide a clean and clear environment. I employed the use of an air filter machine to remove musty odors and provide a freshness to the air in the space. Once the air was purified, I treated the air filter with essential oils that would create the scents of a forest bringing a deeper freshness to the air. The exhibit was divided into three sections: the entrance with process design posters and a digitally animated graphic showcase, the office section and the playground section.

Illustration 39: Exhibition image/Display area[1]

[1] Photo credits to Chian-ann Lu, 2017

In the first section, Next to the entrance, a digitally animated graphic movie presented a 3D walk-though of the newly designed Winship B.204 space. The animation shows the rendering of the design and the footage of the actual Space side by side, allowing the visitors the opportunity to see the differences between real space and virtual space. Posters containing the 3D graphic renderings of early structure building process and completed designs are displayed on walls as one steps in through the entry. Two suspended swings are installed to create the playfulness of the space and to increase the viewers' interaction with the space.

Illustration 40: Exhibition image/Office area[1]

The second section is the studio office space equipped with a drafting table, a studio lamp, a storage cabinet and enhanced with and art works created by the artist moving projected images simulating the natural sky and clouds. My goal was to transform a cement column into a major place of visual pleasure. Images that were projected include the sky with clouds, a forest space, and waves. One might also project symbolic images

[1] Photo credits to Chian-ann Lu, 2017

that support and present the spirit of moving nature into a space with no access to the natural world. The projected images helps to relieve stress and lift the mood of those working in the space.

Illustration 41: Exhibition image/Relaxing area[1]

The third section is the playground and relaxation space where visitors can sit and read and enjoy a relaxing moment in the office. The section is equipped with a large hammock and a bean bag chair above of which is a lighted installation which projects patterns simulating natural light and shadows. In this case the lighted installation visually appears as if the sun were casting shadows through trees during a calming late afternoon time of day color field. Visitors can lie down on the bean bag chair and look up or float gently in the hammock enjoying a quiet of playful experience.

[1] Photo credits to Chian-ann Lu, 2017

The lighted installation again moves a cold interior concrete wall to an illusion of exterior natural dwelling caught during sunset. This section is designed specifically to reduce stress and pressure the inhabitants may be experiencing.

In this exhibition, I play with different senses such as visual, auditory, smell, tactile, and the temperature. The primary purpose is to make the visitors believe that this is not an indoor environment, to achieve the purpose of relaxing process, and thus transforming this indoor space can into a comfortable working environment. The secondary purpose is to present new design ideas to the visitors of this exhibition, like the effects of the playground and the image presentation on the columns. Through the showcase, the visitors can see that a good environment design can have a profound impact on human abilities and it can also affect human being's behavior and feelings.

Chapter 7: Realized design and the virtual design

In the early stage of my design process, I discovered that 3D computer graphic software like SketchUp and V-Ray enables designers to easily visualize their concepts while producing renderings. The software accurately captures ideas and presents the results of a design as one truly imagines it. The graphic software produces precise pre-visualization renders of nearly all elements embedded in the project including the arrangement of the space, the texture of objects and lighted reflection and effects.

With the assistance of the software, designers are afforded an opportunity for better client project communications. Clients are given a clearer view of the project's goals and designers a clearer voice to communicate ideas. The software allows them to complete a project in a more efficient way. Also, the advantage of its pre-visualization function allows the designers to experiment with varied design directions and options without having to incur the costs of actual production.

Wysiwyg, is a similar pre-visualization software often used in theatre applications. I found that they each have advantages and disadvantages when in use. The SketchUp interface is more intuitive and user-friendly. Because it is commonly used, it is now equipped with abundant materials in its model-sharing platform called "the warehouse". Also, with the added V-Ray plug-in, SketchUp produces a highly superior rendering quality to that which is produced when using the Wysiwyg program. However, its disadvantage is that it requires the V-Ray plug-in to produce high quality renderings and V-Ray itself is more a complicated interface and its set up and setting format is less user

friendly than SketchUp is on its own. The learning curve requires a greater amount of commitment for those who are new to this software. V-Ray also requires that one have a computer able to process large amounts of photo-realistic data. All these disadvantages become its barrier for the users. The advantage of Wysiwyg for those trained in the theatrical lighting field is that it was created and designed for stage and concert venue use. In addition the program is compatible with select lighting control consoles. It also offers a built in real-time response option that does not require a high level of computing performance.

I consider both Wysiwyg and SketchUp with the V-Ray plug-in strong software choices for the pre-visualization process. The choice of which software to use when will truly depend upon the needs of the project. If you need a perfect image quality, and you have a device with high level of computing performance, SketchUp and V-Ray will be ideal to use. If you are designing for Stage or concerts venues and do not require a highly photo-realistic pre-visualization rendering then Wysiwyg may prove a better choice for that project.

Chapter 8: Discussion: Feedback from the exhibition viewers

In my thesis exhibition, I aimed to distort the viewers' perception to the space by creating some anomalies within the space. Among the feedback I received from the visitors, I found that people felt most struck by the inclusion of swings in the installation. Surprisingly, many viewers have a strong childhood link to the swings in the display area. My intention was to build a playground within the basement so as to transport people out of doors. It triggers the viewer's childhood memories. As a children, we laugh and play without restriction. This joyful recollection of memory helps viewers to forget their anxiety and lowers stress. In other words, the playfulness works to create a form of relaxation. It also helps everyone to release their individual work pressure. This unexpected but happy outcome helps me to believe that I have succeeded in creating a space that provides a joyful and positive atmosphere.

Another thing I observed was the viewer's' perception of the space. During the exhibit, a viewer shared with me his feelings about my forest sound effect, which was played in the space the entire time. He mentioned he felt the sound was too loud and abrupt at the beginning of his visit. However, this feeling faded away when his brain stopped reminding him that he was in an interior space. The volume of the sounds became reasonable and all of the artificial effects better fit in to the whole of the exhibition. This feedback proved that design indeed has the power to relax a person's psychological state. It hits the target on my chest squarely because it is related to my initial concept of the thesis, which is creating illusion to trick the brain. What is real and

what should we believe? The designed installation space transported its visitors to somewhere out of doors, somewhere natural, a place where the creek flows and the bird chirps in trees. If we close our eyes, we might be made to believe that we were not indoors any longer. Our brain decides how we perceive the world. A tricked perception has the power to create a different world within the space in the mind of the visitor. It is hard for people to determine what is real and what is not. The blurring of lines between the two world brings pleasure to people. When your brain begins to respond to your senses, all of the illusion becomes a reality.

Chapter 9: Reflection and conclusion

Looking back on the design process, I found myself most surprised by the potential of the digital software such as V-Ray and SketchUp and the application of integrated media. I learned a lot and am deeply inspired by the whole process. The journey with this thesis has led me to explore the software in ways I would not have expected to before investigating this particular design process. I plan to bring in the knowledge of this digital software, often utilized in interior design, into the world of theatre design. I seek to apply the skills I learned to my future design in theatre, making the best use of V-Ray, which carries the advantage of high-quality rendering so as to create a better communications between the artistic team and their clients. As for the application of integrated media, I discovered that media helps to alter our visual perceptions when projected on surface architecture. It softens the texture of architecture and offers greater visual design opportunities to the space. It is my goal to utilize ~~i~~ntegrated media into my future designs as lighting and integrated media are each a source of light. I am interested in merging the logic of light and media design together. Including High-End DL1 series products which are able to function both as a moving head lighting fixture and as a moving head projector. I believe it's a way to provide more flexibility to a theatrical lighting designer.

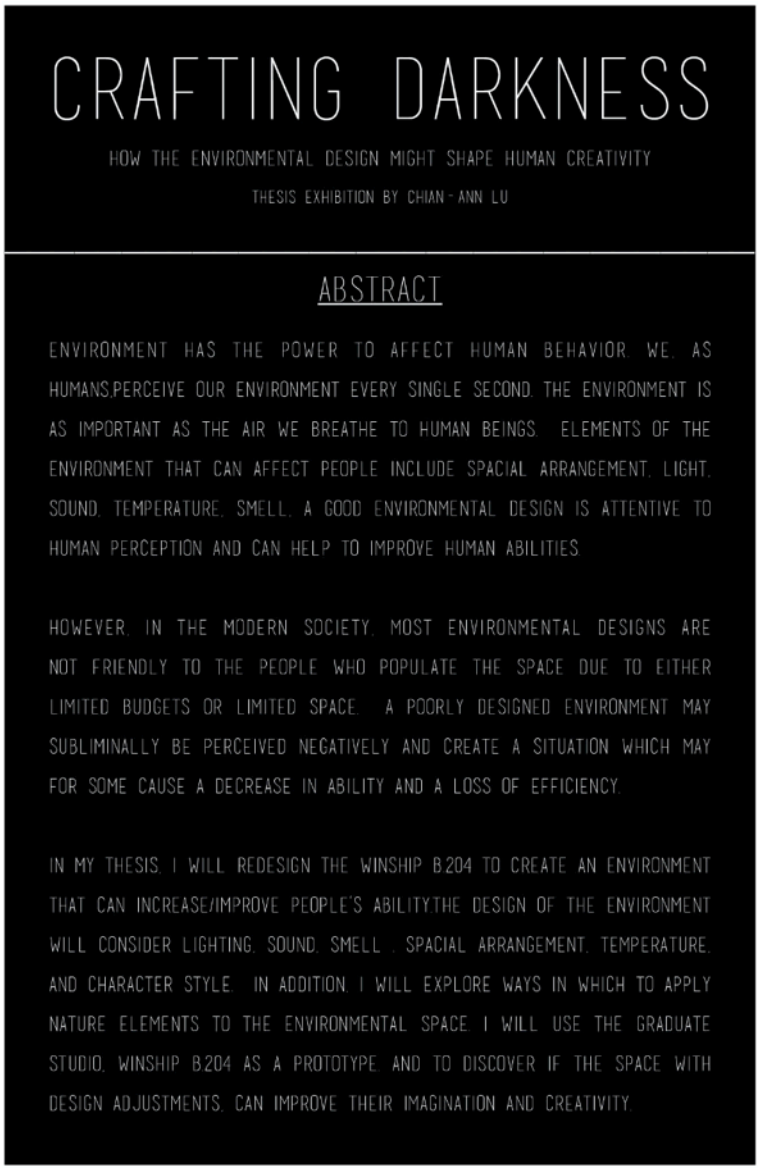
Another important discovery in the process is the impact of the environment on human behavior. In the final exhibition of the project, I noticed some interesting questions. Why does a good environment need to be designed to make people feel moderately relaxed? As relaxation and working efficiency are the two opposite concepts,

it should be contradictory to bring in the elements of relaxation into my design, which views enhancing working efficiency as the ultimate goal. Why can a relaxing environment improve human being's working efficiency? Can a controlled environment like a typical office also help the workers achieve the same efficiency? If so, how long could it last? Take my personal experience for example. I usually spend long periods of time in the basement studio. It is a fine place to work but it does not provide positive visual, auditory or smell stimuli. A space like this decreases creativity and adds stress and pressure. In addition, does not encourage me to willingly arrive early or stay late in the space. If we utilize different playful elements within the space. We can promote relaxation, relieve stress and enhance working efficiency. What makes relaxation and efficiency equal? This hypothesis interests me and I would like to do more research about this topic in order to understand what the relation between the two.

Was this process successful? Looking back on the whole process from the initial idea to the final exhibition, I found it a rewarding experience. I explored multiple concepts and skills such as tricking the brain, diverse thinking, creating visual impacts, environmental psychology, and experimenting with new graphic software. I have learned from this project and understand better how to research a problem, to understand the components and the complexities of a problem and devise ways in which to find solutions to the problem. Through this project, I challenged myself to use unfamiliar software and learned to find a balance between an idea and practice. Although we are not going to actually renovate our studio, my thesis proposes an option for people to think about in the future. I believe the purpose of design is to make the world a better place by providing

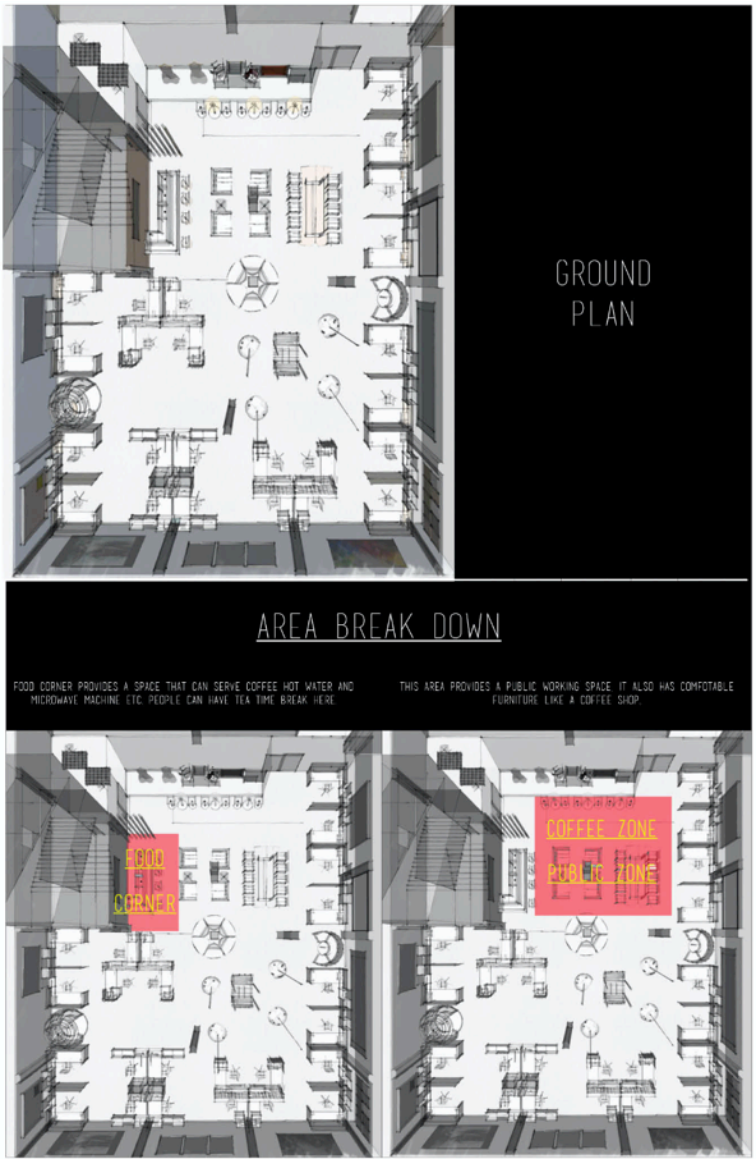
better options. The belief that we deserve a better living space not only defines our role as designers but also propels us further in our future.

Appendix A Exhibition poster.



Appendix B Exhibition poster.

Appendix C Exhibition poster.



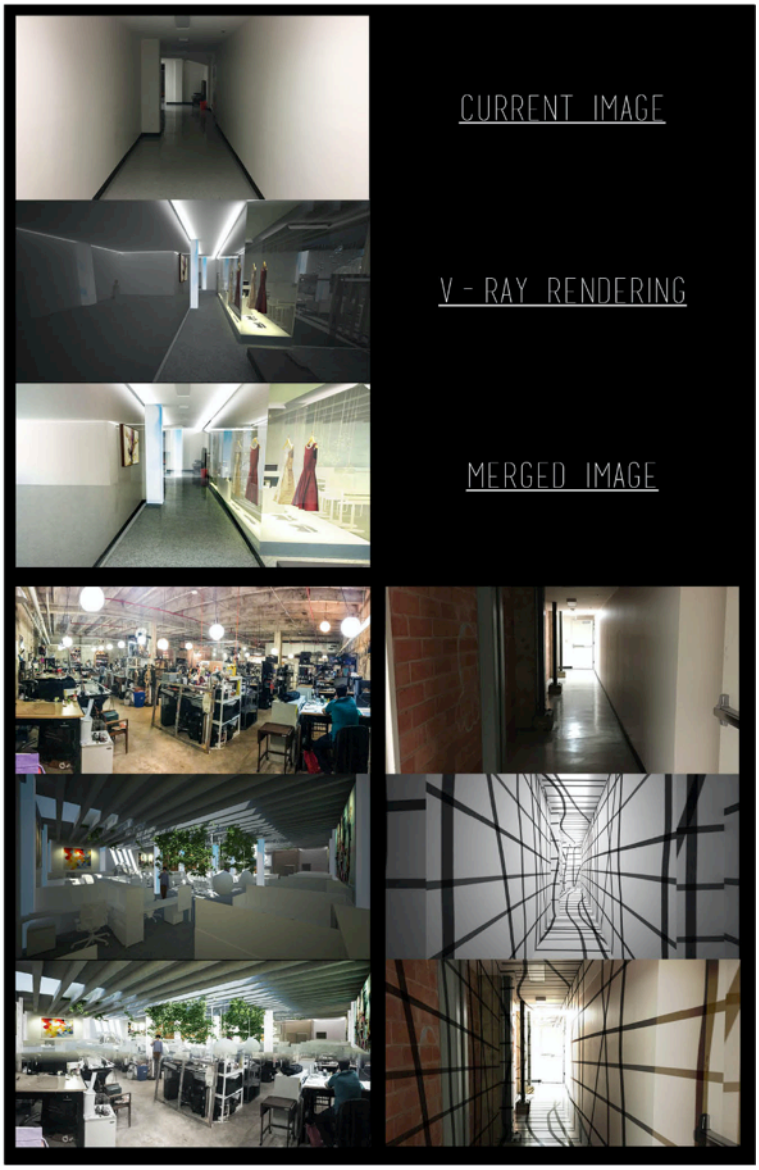
Appendix D Exhibition poster.

Appendix E Exhibition poster.

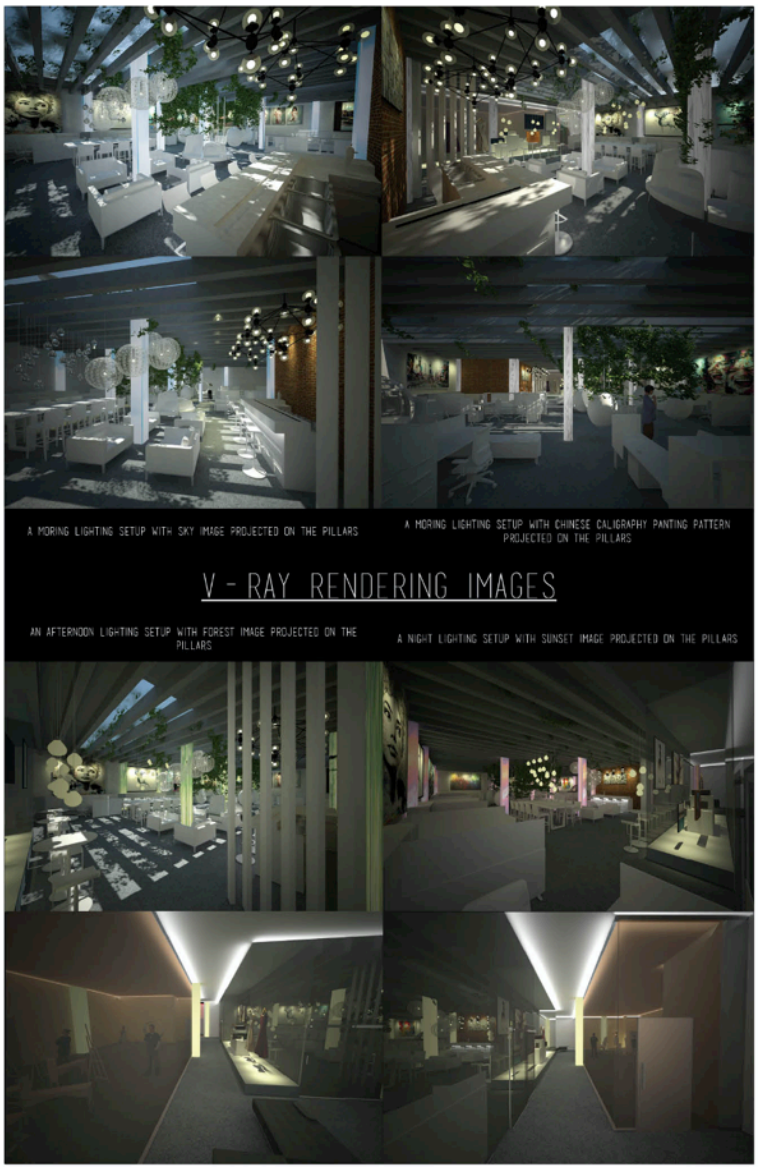
Appendix F　Exhibition poster.

Appendix G Exhibition poster.

Appendix H Exhibition poster.

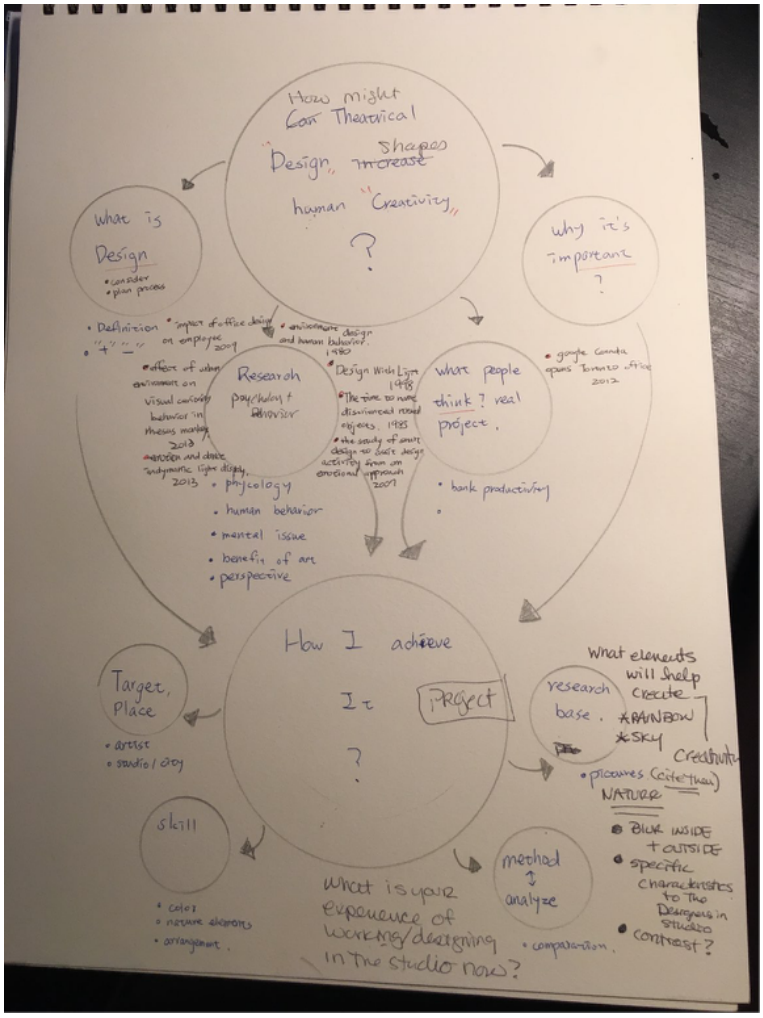


Appendix I　Exhibition poster.

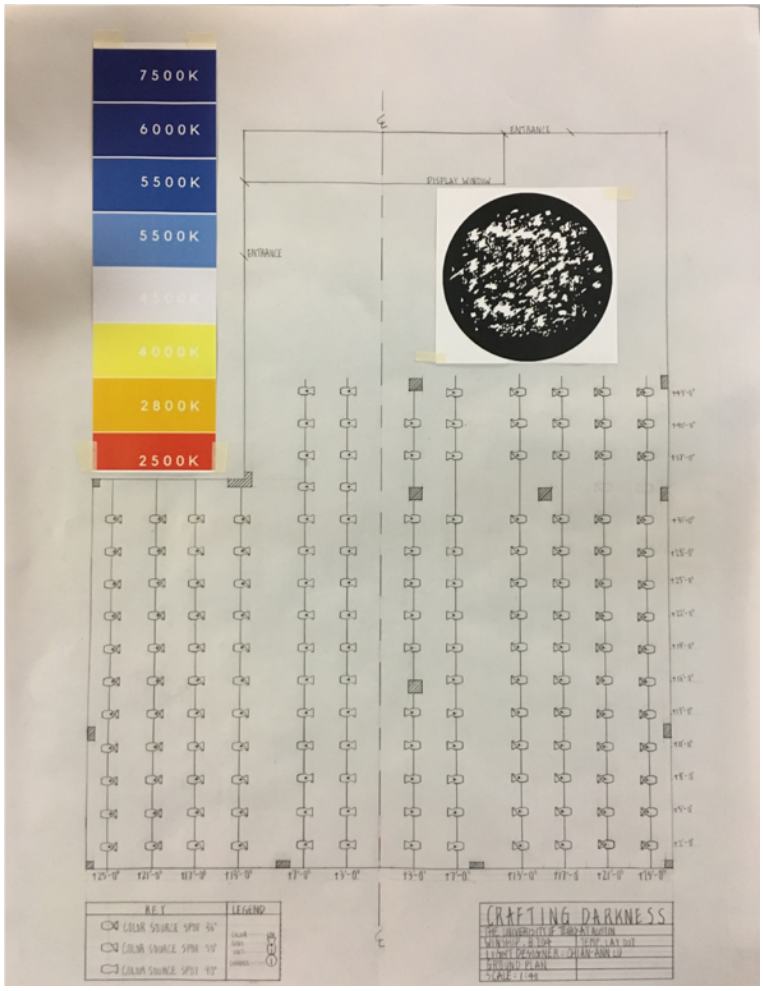


Appendix J Exhibition poster.

Appendix K Initial thesis idea map.



Appendix L Lighting Plot.



Reference

Decoist (Ed.). (2015, March 12). Pinterest. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790169944765/

(n.d.) Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790172963600/

(n.d.). Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790174915188/

(n.d.). Pinterets. Retrieved May 2, 2017, from https://www.pinterest.com/pin/420734790172963673/

SketchUp. (n.d.). Pinterests. Retrieved May 2, 2017, from https://www.pinterest.com/pin/521925044285764430/

SketchUp. (n.d.). In Wikipedia. Retrieved May 2, 2017, from https://en.wikipedia.org/wiki/SketchUp

Pacisoft. (n.d.). V-Ray. Retrieved May 2, 2017, from http://www.pacisoft.vn/en/uncategorized-vi/splash-page-mai-v-ray-sketchup-prison-50-va-nang-cap-mien-africa/

V-Ray. (n.d.).In Wikipedia. Retrieved May 2, 2017, from https://en.wikipedia.org/wiki/V-Ray